Please delete the seventh paragraph on page 7, which starts with "Referring now to Fig. 6.."

Below is a listing of the claims in their current form.

1-24) (PREVIOUSLY CANCELED)

25) (previously amended) A method for use in calculation of a swept volume of a computer generated model of a real-world object, the method comprising:

generating a three dimensional polyhedral representation of the model of the real-world object, the representation comprising a plurality of triangles joined at their edges, said triangles forming a tessellated representation of the modeled real-world object;

representing three dimensional motion of the modeled object by a series of sequential positions of the modeled object in three dimensional space; and

for each position in the series of sequential positions of the modeled object,

(i) determining a subset of the edges such that each edge in said subset has a trajectory through a corresponding first zone in which motion of the corresponding edge comprises motion on the boundary of the modeled swept volume during motion of the modeled object from a current position to a next position, where each such edge's corresponding first zone comprising a region external to the material of the modeled object and bounded by a planar extension of the triangles that join at said edge;

(ii) determining a subset of the triangles such that each triangle in said subset has a trajectory through a corresponding second zone during motion of the modeled object from a preceding position to a current position and from the current position to a next position; and where:

each such triangle's second zone comprises a zone represented by a half sphere,

said half sphere comprising a flat face that is planar with said triangle, and

said half sphere extending interior to the modeled object, and

said second zone representing a space that had been occupied by at least a portion of the modeled object when the modeled object was positioned at said preceding position;

(iii) generating a trace of the motion of said subset of edges between said current and said next positions; and

constructing a representation of the swept volume from the generated traces of the motion of said subset of edges

wherein constructing a representation of the swept volume further comprises bounding the swept volume at each of said current positions in said series by said subset of triangles associated with each such current position.

26) (Previously Canceled)

27) (cancelled)

28) (original) The method of claim 25 wherein the motion between two consecutive positions of the modeled object is modeled as linear motion.

29) (Previously Canceled)

30) (original) The motion of claim 25 wherein the representation of sequential positions of motion comprise rotational and translational representations.

31) (previously amended) A computer system for use in computing swept volume for a model of a real-world object, the system comprising:

a processor operatively interconnected to a memory;

a user input device; a display; and

a graphical user interface responsive to activation with the user input device by causing a program stored in the memory to be executed by the processor, said program configuring the processor to perform computations whereby:

(a) a three dimensional polyhedral representation of a computer model of a real-world object is generated, the representation comprising a plurality of triangles joined at their edges, said triangles forming a tessellated representation of the modeled real-world object,

(b) three dimensional motion of the modeled object is represented with a set of position matrices,

(c) for each of a series of sequential positions of the modeled object as represented by the matrices,

(i) a subset of the edges is determined such that each edge in said subset has a trajectory through a corresponding first zone in which motion of the corresponding edge comprises motion on the boundary of the modeled swept volume during motion of the modeled object from a current position to a next position and where each such edge's corresponding first zone comprises a region external to the material of the modeled object and bounded by a planar extension of the triangles that join at said edge,

(ii) a subset of the triangles is determined such that each triangle in said subset has a trajectory through a corresponding second zone during motion of the modeled object from a preceding position to a current position and from the current position to a next position and where each such triangle's second zone

comprises a zone represented by a half sphere, said half sphere comprising a flat face that is planar with said triangle and said half sphere extending interior to a space that had been occupied by at least a portion of the modeled object when the modeled object was positioned at said preceding position,

(iii) traces are generated by the motion of the subset of edges during motion between a current and a next position; and

(d) a representation of the swept volume is constructed from the traces of the subset of edges and bounded at each of said current positions in said series by said subset of triangles associated with each such current position.

32) (Previously Canceled)

33) (original) The computer system of claim 31 wherein the position matrices representing motion comprise motion data associated with a real-world object that is collected during physical experiments.

34) (previously canceled)

35) (previously amended) A computer program residing on a computer-readable medium, the program comprising instructions for causing the computer to:

(a) generate a three dimensional polyhedral representation of a computer model of a real-world object, the representation comprising a plurality of triangles joined at their edges, said triangles forming a tessellated representation of the modeled real-world object;

(b) represent three dimensional motion of the modeled object with a set of position matrices;

(c) for each of a series of sequential positions of the modeled object as represented by the matrices;

(i) determine a subset of the edges such that each edge in said subset has a trajectory through a corresponding first zone in which motion of the corresponding edge comprises motion on the boundary of the modeled swept volume during motion of the modeled object from a current position to a next position and where each such edge's corresponding first zone comprising a region external to the material of the modeled object and bounded by a planar extension of the triangles that join at said edge,

(ii) determine a subset of the triangles such that each triangle in said subset has a trajectory through a corresponding second zone during motion of the modeled object from a preceding position to a current position and from the current position to a next position and where each such triangle's second zone comprises a zone represented by a half sphere, said half sphere comprising a flat face that is planar with said triangle and said half sphere extending interior to a space that had been occupied by at least a portion of the modeled object when the modeled object was positioned at said preceding position, and

(iii) generate traces of the motion of the subset of edges during motion between a current and a next position; and

(d) construct a representation of the swept volume from the traces of the subset of edges and bounded at each of said current positions in said series by said subset of triangles associated with each such current position.

36) (previously amended) A method for use in calculation of a swept volume of a computer generated model of a real-world object, the method comprising:

(a) generating a two dimensional representation of the model of the real-world object, the representation comprising a plurality of edges joined at vertices;

(b) representing two dimensional motion of the modeled object by a series of sequential positions of the modeled object in two dimensional space; and

(c) for each position in the series of sequential positions of the modeled object,

(i) determining a subset of the vertices such that each vertex in said subset has a trajectory through a corresponding first zone in which motion of the corresponding edge comprises motion on the boundary of the modeled swept volume during motion of the modeled object from a current position to a next position and where each such edge's corresponding first zone comprising a region external to the material of the modeled object and bounded by a planar extension of the edges that join at said vertex,

(ii) determining a subset of the edges such that each edge in said subset has a trajectory through a corresponding second zone during motion of the modeled object from a preceding position to a current position and from the current position to a next position and where each such edge's second zone comprises a material zone represented by a half circle, said half circle comprising a flat face that is aligned along said edge, said edge being elements of a tessellated representation of the modeled real-world object, and said half circle extending interior to a space that had been occupied by at least a portion of the modeled object, when the modeled object was positioned at said preceding position, and

(iii) generating a trace of the motion of said subset of vertices between said current and said next positions, and

(d) constructing a representation of the swept volume from the generated traces of the motion of said subset of vertices and edges.

37) (Previously Canceled)

38) (original) The method of claim 36 wherein the motion between two consecutive positions of the modeled object is modeled as linear motion.

39) (New) A method for use in calculation of a swept volume of a computer generated model of a real-world object, the method comprising:

generating a three dimensional polyhedral representation of the model of the real-world object, the representation comprising a plurality of triangles joined at their edges, said triangles forming a tessellated representation of the modeled real-world object;

representing three dimensional motion of the modeled object by a series of sequential positions of the modeled object in three dimensional space; and

for each position in the series of sequential positions of the modeled object,

(i) determining a subset of the edges such that each edge in said subset has a trajectory through a corresponding first zone in which motion of the corresponding edge comprises motion on the boundary of the modeled swept volume during motion of the modeled object from a current position to a next position, where each such edge's corresponding first zone comprising a region external to the material of the modeled object and bounded by a planar extension of the triangles that join at said edge;

(ii) generating a trace of the motion of said subset of edges between said current and said next positions; and

constructing a representation of edge portions of the swept volume from the generated traces of the motion of said subset of edges.

40) (New) A method for use in calculation of a swept volume of a computer generated model of a real-world object, the method comprising:

generating a three dimensional polyhedral representation of the model of the real-world object, the representation comprising a plurality of triangles joined at their edges, said triangles forming a tessellated representation of the modeled real-world object;

representing three dimensional motion of the modeled object by a series of sequential positions of the modeled object in three dimensional space; and

for each position in the series of sequential positions of the modeled object,

(i) determining a subset of the edges such that each edge in said subset has a trajectory through a corresponding first zone in which motion of the corresponding edge comprises motion on the boundary of the modeled swept volume during motion of the modeled object from a current position to a next position, where each such edge's corresponding first zone comprising a region external to the material of the modeled object and bounded by a planar extension of the triangles that join at said edge;

(ii) determining a subset of the triangles such that, for a current position of each such triangle, motion between that current position and any subsequent or preceding position comprises motion along a trajectory directed through the interior of the modeled object;

(iii) generating a trace of the motion of said subset of edges between said current and said next positions; and

constructing a representation of the swept volume from the generated traces of the motion of said subset of edges

wherein constructing a representation of the swept volume further comprises bounding the swept volume at each of said current positions in said series by said subset of triangles associated with each such current position.

41) (new) The method of claim 40 where trajectory of motion of said triangles is approximated by analysis of motion of a point on the surface of the triangle.

42) (new) A method for use in calculation of a swept volume of a computer generated model of a real-world object, the method comprising:

generating a three dimensional polyhedral representation of the model of the real-world object, the representation comprising a plurality of triangles joined at their edges, said triangles forming a tessellated representation of the modeled real-world object;

representing three dimensional motion of the modeled object by a series of sequential positions of the modeled object in three dimensional space; and

for each position in the series of sequential positions of the modeled object,

(i) determining a subset of the edges such that each edge in said subset has a trajectory through a corresponding first zone in which motion of the corresponding edge comprises motion on the boundary of the modeled swept volume during motion of the modeled object from a current position to a next position, where each such edge's corresponding first zone comprising a region external to the material of the modeled object and bounded by a planar extension of the triangles that join at said edge;

(ii) determining a subset of the triangles such that, for a current position of each such triangle, motion between that current position and any subsequent or preceding position comprises motion on a vector directed through the interior of the modeled object and where motion of the triangle along the vector is determined at a representative point on the surface of the triangle, motion of said representative point being used to approximate motion of said triangle;

(iii) generating a trace of the motion of said subset of edges between said current and said next positions; and

constructing a representation of the swept volume from the generated traces of the motion of said subset of edges

wherein constructing a representation of the swept volume further comprises bounding the swept volume at each of said current positions in said series by said subset of triangles associated with each such current position.